

# REPORT MOBILITY EVENT DUBLIN

## 1. AGENDA

### Monday 4<sup>th</sup> February 2019 | Introduction Day: Guided tour on new TU Dublin Campus

10.00h Welcome coffee and Tour @ new TU Dublin Campus in Grangegorman Road  
 12.30h Lunch  
 13.30h Interactive feedback session on the outcomes of the PhD Mobility Week  
 16.30h End

### Tuesday 5<sup>th</sup> February 2019 | Meeting day

09.00h 5<sup>th</sup> Transnational Meeting  
 13.00h Lunch  
 14.00h Interactive discussion PREFER Test tool  
     - Presentation state-of-affairs motivational test & discussion  
     - Presentation state-of-affairs competence test & discussion  
 16.30h End  
 18.30h Dinner Dublin

### Wednesday 6<sup>th</sup> February 2019 | Company and Federation Day

9.00h Transport to ESB Turlough Hill Power Station in Wicklow Mountains  
 10.00h Guided tour at the ESB Hydro power station  
 13.00h Transport back to Dublin Center  
 14.00h Lunch @ ESB Head Quarters  
 15.00h Meeting session with ESB, PREFER team and Engineers Ireland  
     - Presentation of ESB Representative Denis Kelly – ESB corporate capabilities  
     - Presentation research activities/output PREFER tea  
     - Presentation of Engineers Ireland President Damien Owens  
 17.30h End  
 19.00h Consortium dinner in Dublin City Center

### Thursday 7<sup>th</sup> February 2019 | Training day: CREATE Workshop

10.30h Reflection and discussion on observations ESB & Engineers Ireland Meeting  
 13.00h Short Lunch  
 14.00h Interactive Workshop with the researchers of the CREATE Group  
     - Presentations PREFER research team: Sofie, Mariana & Darren  
     - Presentations CREATE research team: Una Beagon, Rachel Harding & Diana Adela Martin  
 17.00h End  
 18.00h PREFER & CREATE Dinner in Dublin City Center

### Friday 8<sup>th</sup> February 2019 | SWOT Analysis & Looking Forward

10.00h Wrap up & debriefing mobility week  
 10.15h SWOT analysis of PREFER collaboration & deliverables  
 11.30h Meeting with Prof. Marek Rebow, Head of Research, College of Engineering and Built Environment at TU Dublin  
 12.30h Wrap up Mobility Event & goodbye



## 2. MONDAY FEBRUARY 4<sup>TH</sup> 2019 – Introduction day

At the first day of the mobility event, we received a warm welcome from our host Kevin Gaughan at the premises of the historic site of TU Dublin located in Grangegorman Road. Recently, three Dublin located institutes of Technology (Dublin Institute of Technology (DIT), Institute of Technology Tallaght (ITT), and Institute of Technology



Blanchardstown (ITB)) merged into one new institution: Technological University Dublin (TU Dublin).



TU Dublin is now constructing a new campus in the Dublin city center on the premises of the old psychiatric facility of St. Brendan's Hospital. The newly constructed campus will be based in the Dublin city center and will host a wide range of education and student facilities. The PREFER team received a guided tour of the campus that will open in 2020 to over

10.000 students. The future of the new star at the Dublin skyline sure looks bright!

In the afternoon session, the three PhD researchers of the PREFER project, Sofie Craps, Darren Carthy, and Mariana Leandro Cruz, presented the outcomes of the PhD mobility week to the other members of the PREFER team. In an interactive discussion session format, alignment between the three research trajectories was pursued. Together we critically explored how we could extend and replicate our research activities inside and outside of the PREFER consortium. Through in-depth discussion, we examined interesting publication channels for the PREFER research activities and pitfalls associated with the publication process.



### 3. TUESDAY FEBRUARY 5<sup>TH</sup> 2019 – Meeting day

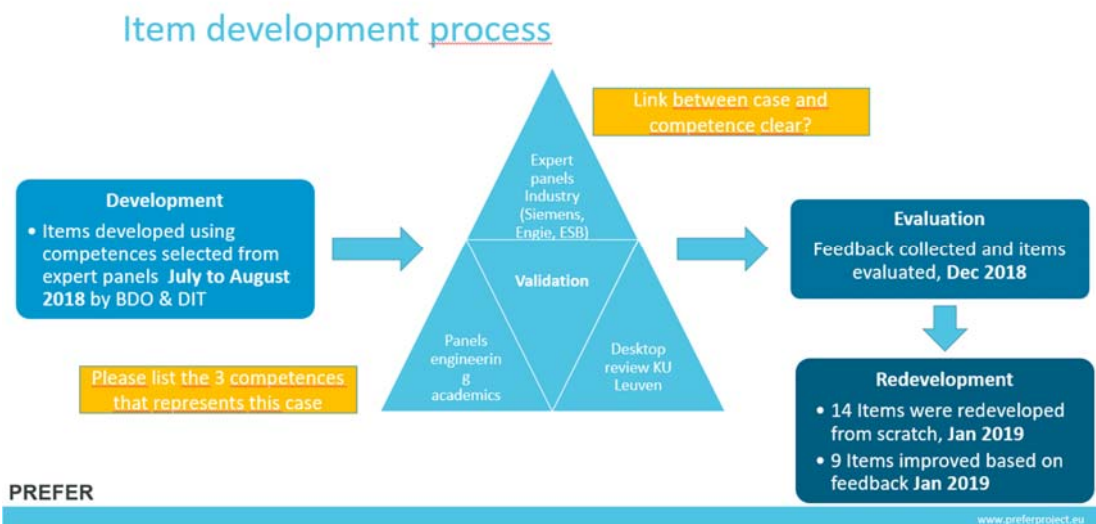
#### A. Transnational Meeting

During the fifth Transnational Meeting of the PREFER project, following elements were discussed in greater detail:

1. **Financial state-of-affairs of core partners**
2. **Inventory of deliverables** (alignment between promised deliverables in the project application and current state-of-affairs of the research activities)
3. **Revised project website**
4. **SEFI 2019 contributions from the PREFER team**
5. **Date Final mobility event Leuven (February 2020)**

#### B. Interactive discussion PREFER test tool

On Tuesday afternoon, a full session was dedicated to the development of the PREFER test tool. Guided by Maarten (KU Leuven) and Darren (TU Dublin), all project partners were invited to critically reflect on items that have been developed for the test tool. All partners were thoroughly briefed on the review activities undertaken in collaboration with the industry partners (ESB, Engie & Siemens) and engineering academics (TU Dublin).





The PREFER test tool will generally comprise two separate elements. In the first part, currently called the motivational test, we aim to trigger students' interests regarding each of the professional roles in a lightweight manner. Based on 10 realistic short cases, students will be requested to indicate their most and least preferred option out of three activities. Afterwards, students will receive qualitative feedback that places them on a continuum for each of the of the three professional roles. All partners agree that it is crucial to provide students with nuanced feedback (rather than a pure numerical score) that enables a qualitative interpretation.

#### SJT ITEM: POSITIVE CRITICAL ATTITUDE

Sarah is a senior automation engineer at a brewery which is currently being fitted with a new stainless steel tank for storing the finished beer. The tank requires several control systems, including temperature and humidity sensors.

Robert, one of the junior engineers, has asked Sarah if he can install the sensors. He says he has done this before during an internship in another brewery. Sarah has asked him to be careful because the sensors are fragile and expensive. If they are not mounted correctly, they may break.

When Robert unpacks the sensors, he notices that the sensors that Sarah has purchased are indeed more fragile than the ones he worked with before. Moreover he knows they are more expensive and less sensitive. Sarah sees that Robert is carefully studying the sensors. She asks if everything's ok. Robert replies:

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or less appropriate. In providing this feedback, special attention should be given to students with special needs.

In the second part of the tool, 23 Situational Judgement Tests (SJT's) are developed that reflect each of the defining competences that were identified in the expert panels. Engineering students will be requested to rate the appropriateness of four different responses. Students will then receive qualitative feedback for each of the competences and this will be linked to the three professional roles. Based on the feedback received from the colleagues at TU Delft who were not directly involved in the development process, it is agreed that we should refrain from providing quantitative feedback regarding skills levels. From a didactical perspective, we should open the black box as much as possible and qualitatively explain to students why particular responses are more





## 4. WEDNESDAY FEBRUARY 6<sup>TH</sup> 2019 – Company & federation day

### A. Site visit ESB Hydro Power Station Turlough Hill

The third day of the Mobility Week started with a site visit to the [ESB Hydro Power Station](#) on Turlough Hill, 60 kilometers South of Dublin. The visit was organized by ESB representative **Denis Kelly** in order to familiarize the PREFER team with some of the operational activities of ESB. The site visit proved to be an excellent opportunity for the team to get acquainted with what is actually required from young engineers once they enter the labor market. A first-



hand experience with the rigorous safety measures in the plant was very inspirational and a great opportunity to see how different elements of the contemporary engineering curriculum (mechanics, control systems, fluid dynamics, electricity,...) merge in engineering practice.

### B. Interactive Meeting at the ESB Head Quarters

After the site visit, we engaged in an interactive discussion with a team of ESB representatives, supervised by **Mr. Denis Kelly**, Manager Engineering Capability Development at ESB and **Mr. Damien Owens**, Registrar of Engineers Ireland.

At the kick-off of this intensive afternoon session, our host Mr. Denis Kelly presented the latest developments at his ESB division regarding the strategic engineering capabilities. In order to map business strengths and capabilities, ESB developed a matrix to evaluate current needs and future challenges in terms of human capital (critical current > critical core > critical future). Which resources are currently present in the company and how does this match with future strategic directions? It was an inspiring lesson to learn more on the continuous alignment process between required skills and capacities of new hires on the one hand and strategic business decisions on future developments on the other.



In the following part of the session, the three PhD researchers of the PREFER team presented the interim results of the project to the ESB and Engineers Ireland team. We started with the most recent state of affairs of the professional role model (Sofie & Maarten), followed by the work of Darren on the test tool development. Finally, Mariana presented the most recently developed

curriculum elements. The feedback received from all participants proved to be very useful to further refine our research activities.

In the last part of the session, Damien Owens from Engineers Ireland presented the wide range of activities that Engineers Ireland is involved in (e.g., programme accreditation, employment services, CPD training, ...). Damien also presented some very interesting findings of the [most recent barometer](#) of the engineering profession in Ireland. For example, 79% of the general public considers engineering a rewarding career choice for young people. This finding indicates that people generally favor the engineering profession. However, skills shortage is identified as an important treat by employers: 49% of the respondents expects an inadequate supply of engineers in the medium run. These findings provided more than enough food for thought for more in-depth discussions during the consortium dinner in the Dublin city Center. The consortium dinner was also attended by **Prof. Mike Murphy**, SEFI President and Director of Academic Affairs at TU Dublin.

## 5. THURSDAY FEBRUARY 7<sup>TH</sup> 2019 – CREATE WORKSHOP

### A. Discussion and reflection

In an open morning session, all PREFER members were invited to participate in reflective exercise on the experiences of the previous day. An in-depth discussion between KU Leuven and TU Dublin researchers on the piloting of the SJT's resulted in valuable insights.

### B. CREATE Workshop

In the afternoon, we had an interactive discussion session with the researchers of the [CREATE research Group of TU Dublin](#), headed by **Professor Brian Bowe** (TU Dublin). The CREATE research group is a



multidisciplinary collaboration of researchers working on different aspects of engineering education research. The exchange of ideas and insights enabled the members of the PREFER team to take a fresh perspective and to approach our work from a different angle.



## 1 Mariana Leandro Cruz (TU Delft) - Development Curriculum elements



Mariana presented the state-of-affairs regarding her work of the development of the curriculum elements. More specifically, she shared the output of the Chinese whisper exercise that has been piloted at TU Delft, KU Leuven and TU Dublin. Practical arrangements for implementing these curriculum elements in other institutions were discussed between

all participants. More specifically, the practical configuration of transferring research findings on curriculum elements to other institutional contexts was addressed.





## 2 Darren Carthy (TU Dublin) - Development test tool



Darren presented the outcomes of the pilot data of the motivational test that has been running at TU Dublin and KU Leuven. Based on the feedback data of the TU Dublin and KU Leuven sample, results look promising. Students generally seem to be interested in their personal result and the majority indicated that (1) they found the cases interesting and (2) that they enjoyed filling in the test. These positive impressions indicate that there is a clear need for engineering students to get acquainted with the professional roles model.

## 3 Maarten Pinxten & Sofie Craps (KU Leuven) - Development Role model

The KU Leuven team presented the state-of-affairs of the research on the professional roles framework. In the CREATE workshop, the professional roles model was presented together with associated competences identified through a series of industry expert panels. Doctoral researcher Sofie Craps (KU Leuven) is currently examining the role of awareness of the professional roles on job expectancies and job fit. Using a longitudinal research design, she will investigate the effect of exposure to the model to student's career choices.

What is the effect of awareness  
of professional roles  
on job expectations and  
on job fit?

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## 4 Una Beagon (TU Dublin)- Lecturers perceptions of engineering professional skills

Doctoral researcher **Una Beagon** presented the output of her study on how academics experience professional skills in engineering education. Through mixed-methods research, she is identifying the ways in which academics conceptualize teaching and professional skills. Preliminary findings of 2 qualitative interviews based on phenomenographic methodology indicate that professional skills are either perceived as an wider umbrella term and even sometimes as a subset ('enabler') of technical skills.





## 5 Rachel Harding (TU Dublin)- Spatial skills of pre-service teachers in Ireland

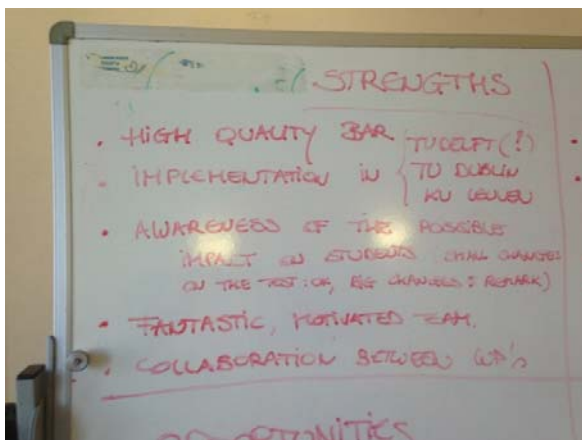
Doctoral researcher **Rachel Harding** focuses on spatial skills. Prior research has indicated that pre-service teachers' levels of geometry and spatial abilities are substantially weaker compared to other math domains. In her research, she is currently examining the role of spatial anxiety in pre-service teacher preparation to the labor market. More specifically, she is empirically investigating the relation between spatial anxiety and spatial abilities and gender differences in this relation.

## 6 Diana Adela Martin (TU Dublin) - Evidence of ethics in Engineering Accreditation documents

The research of Doctoral research **Diana Adela Martin** centers on the role of ethics in engineering education. In order to enhance the social responsibilities of engineers, she is currently examining patterns of ethics education in engineering education through mixed-methods research. Based on qualitative analysis of programme documents submitted for accreditation and interviews with lecturers, she aims to determine the role of ethics in the engineering curriculum. Additionally, based on a quantitative analysis of the POLO-scores (ranging between 0-4) for seven programme outcomes, the relative position of ethics compared to other skills is numerically determined.

## 6. FRIDAY 8<sup>TH</sup> FEBRUARY – SWOT Analysis & looking forward

On the final day of the TU Dublin Mobility event we had a debriefing of the past week. In a critical SWOT analysis supervised by **project promotor Greet Langie**, the 3 core partners of the PREFER consortium, **Professor Gillian Saunders** (TU Delft) and **Professor Kevin Gaughan** (TU Dublin) identified the strengths, weaknesses, opportunities and treats of the collaboration.



The most important strengths of the current collaboration consisted of four elements. First, as a project team, we are setting a high bar for the project deliverables. Second, we managed to implements several research activities in multiple institutions (in contrast with single institution implementation). Third, we are all aware of the direct impact the project outcomes have on students. Students' responses on the project deliverables are overly positive and this is strong





driver to continue with the project implementation. Fourth, we managed to set-up a highly motivated and complementary team that is committed to delivering the project outcomes.

After this critical analysis, we had a strategic meeting with **Professor Marek Rebow**, Head of Research at the College of Engineering and Built Environment at TU Dublin. We introduced the PREFER objectives and interim output and potential implementations of the project outcomes. Opportunities for future collaborations between our three institutions were jointly explored.